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ARIZONA CORPORATION COMMISSION
UNION PACIFIC'S RESPONSES TO FIRST SET OF DATA REQUESTS
DOCKET NO. RR-03639A-11-0262
Tangerine Road in Marana, AZ
August 5, 2011

CW 1.1 Provide Average Daily Traffic Counts ("ADT") for each of the locations [one].

Response: ***Union Pacific Railroad Company ("Union Pacific") must rely on information provided by others to provide ADT's. With that caveat, Union Pacific responds as follows:***

Crossing	*ADT*	*Source*
Tangerine Road	*6,500*	*Traffic Count provided by Keith Brann, Town of Marana, Assistant Director of Public Works*

Source: ***1) Jennifer Crumbliss, HDR Engineering, 8404 Indian Hills Drive, Omaha, NE 68114.***
2) Keith Brann, Assistant Director of Public Works, Town of Marana, 11555 W Civic Center Dr. Bldg A2, Marana, AZ 85653 (Emailed Traffic Counts, 6/22/11)

CW 1.2 Please describe the current Level of Service (LOS) at each intersection.

Response: Union Pacific believes that the level of service analysis is concerned with mobility rather than safety. In addition, Union Pacific must rely on information provided by others to calculate the level of service. With those caveats, Union Pacific responds as follows:

Crossing	*LOS(AM/PM)*
Tangerine Road	*Eastbound (LOS=A), Westbound (LOS=A)*

Source: ***Traffic level of service calculations were performed using Synchro and SimTraffic programs under the direction of Heidi Schneider with HDR Engineering, Inc at 5210 E Williams Circle, Suite 503, Tucson, AZ 85711, (520) 584-3600. The train delay times utilized in the analysis were provided by Tom Domres, with TKDA at 750 Shoreline Drive, Suite 100, Aurora, IL 60504, (630) 499-4110 via Union Pacific.***

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CW 1.3 Provide any traffic studies done by the road authorities for each area.

Response:

1) ***2030 Regional Transportation Plan (Pima Association of Governments) on http://www.pagnet.org/Programs/TransportationPlanning/PlansandPrograms/RegionalTransportationPlanandStudies/2030RegionalTransportationPlan/2030RTPDocuments/tabid/382/Default.aspx***

2) ***2010 Final Traffic Engineering Study, by ADOT Traffic Consultant, Kittelson & Associates, 33 N. Stone Ave., Suite 800, Tucson, AZ 85701***

3) ***Tangerine Road DCR (I-10 to La Canada), by Town of Marana Consultant, Psomas, Alejandro Angel, 800 E. Wetmore Road, Suite 110, Tucson, AZ 85719 (520-292-2300)***

CW 1.4 Provide the population of the City the crossing is located in.

Response: The 2010 US Census shows the following data for the population of the community located around the crossing:

Crossing	*Population (2010)*
Tangerine Road	*34,961*

Note: The Town of Marana population was used for Tangerine Road.

CW 1.5 Provide what warning devices are currently installed at the crossing.

Response: The current warning devices installed at the crossing are gates and flashers with advance warning signs per the MUTCD. The specific devices are noted below:

Crossing	*Warning Devices*
Tangerine Road	*Dual Gates and flashers*

Source: Jennifer Crumbliss, Senior Transportation Engineer with HDR Engineering, Inc. at 8404 Indian Hills Drive, Omaha, NE 68114

CW 1.6 Provide distances in miles to the next public crossing on either side of the proposed project location. Are any of these grade separations?

Response: Union Pacific believes that the last question in CW 1.6 raises an issue that is irrelevant, namely, whether either of the next public crossings is a grade separation. With that caveat, Union Pacific responds as follows:

Crossing	*TO THE WEST*	*TO THE EAST*
Tangerine Road	*4.03 miles to Marana Rd*	*4.73 miles to Camino de Manana Rd*

There is a new grade separated crossing at Twin Peaks / Camino de Manana Rd. located 4.73 miles east of Tangerine Road and it is the only adjacent crossing that is currently grade separated.

Source: HDR's use of the Union Pacific Straight-line Diagrams and www.MapQuest.com.

CW 1.7 How and why was grade separation not decided on at this time? Please provide any studies that were done to support these answers.

Response: Union Pacific understands that whether a grade separation is needed is primarily a question of mobility and convenience for vehicular traffic on the roadway, not safety. That is because an at-grade crossing can be safe without constructing a grade separation and eliminating the grade crossing. Based on this understanding, Union Pacific believes the question of whether a grade separation is needed is irrelevant to Union Pacific's application to add a second mainline track at this grade crossing.

In addition to the foregoing, grade separation at this crossing is not appropriate for determination at this time because, as Union Pacific understands the situation, the local communities and roadway authorities have not finally determined what priority grade separations at various crossings would have with respect to other public projects, when construction of grade separations could be begun and finished, and how grade separations would be funded. Grade separation was not decided on at this time for this crossing because the communities and roadway authorities should decide the final timing of any proposed grade separations. Before they have done so, it would be premature to consider grade separation now in connection with Union Pacific's application to double-track and improve this crossing.

Furthermore, Union Pacific believes the crossing involved in this application is safe without constructing a grade separation. This

conclusion is supported by the fact that the Federal Highway Administration authorizes the use of gates and lights at multiple-track grade crossings as proposed in this application.

With those caveats, Union Pacific responds as follows:

Union Pacific is aware that a new grade separation has opened to traffic at Twin Peaks / Camino do Manana Road. Union Pacific is also aware that grade separations are planned at Ina Road and Ruthrauff Road as part of a joint ADOT/RTA project that includes four interchanges and I-10 reconstruction. The Preliminary Engineering and Environmental Assessment for this project is currently underway and is due to be completed in September 2011. The final design will begin in early 2012 with a potential construction start after 2020. The project is currently locally and federally funded. For more information please contact ADOT's project manager:

Asadul (Asad) Karim
ADOT Roadway Predesign Section A
205 S. 17th Avenue, Mail Drop 605E
Phoenix, Arizona 85007-6807
Phone: (602) 712-6799
Email: AKarim@azdot.gov

Union Pacific is also aware that a new grade separation project for a shifted Tangerine Road location was designed and then shelved by the Town of Marana until development pressure returns in the area. For more information please contact Town of Marana's project manager:

Keith Brann, P.E., CFM
Town Engineer
Town of Marana
11555 W. Civic Center Drive
Marana, Arizona 85653
Phone: (520)-382-2600
Fax: (520)-382-2644
Email: kbrann@marana.com

CW 1.8 If this crossing [were] grade separated, provide a cost estimate of the project.

Response: ***Again, Union Pacific understands that whether a grade separation is needed is primarily a question of mobility and convenience for vehicular traffic on the roadway, not safety. That is because an at-grade crossing can be safe without constructing a grade separation and eliminating the grade crossing. Based on this understanding, Union Pacific believes the question of whether a grade separation is needed is irrelevant to Union Pacific's application to add a second mainline track at this grade crossing. In addition, any attempt to estimate the cost to construct a grade separation would be speculative in the absence of a detailed study of the particular crossing in question and final design for the grade separation. With those caveats, Union Pacific responds as follows:***

In connection with its application to upgrade the crossing of Union Pacific tracks at the intersection of Power and Pecos Roads, RR-03639A-07-0398, the Town of Gilbert estimated that a grade separation at that location would cost $22 million. Depending on the particular crossing involved, a reasonable range for the costs of constructing a grade separation alone would be between $20 million and $40 million.

The ADOT Preliminary Design for the proposed grade separations at Ina and Ruthrauff Roads estimates costs of approximately $120 million and $140 million, respectively. This includes the cost to reconstruct the I-10 mainline, the ramps, and the frontage roads in connection with grade separating Ina and Ruthrauff Roads and the railroad tracks because the tracks are in such close proximity to the interstate.

Please contact the ADOT Project Manager for a more detailed grade separation cost at these two locations:

Asadul (Asad) Karim
ADOT Roadway Predesign Section A
205 S. 17th Avenue, Mail Drop 605E
Phoenix, Arizona 85007-6807
Phone: (602) 712-6799
Email: AKarim@azdot.gov

CW 1.9 Please describe what the surrounding areas are zoned for near this intersection. i.e. Are there going to be new housing developments, industrial parks etc.

Response: ***Union Pacific believes that the second part of CW 1.9 calls for speculation as to whether new housing developments, industrial parks, or other developments will occur in the future. In addition, Union Pacific does not have access to such information, but instead must rely on information provided by others. With those caveats, Union Pacific responds as follows:***

Pima Association of Governments has a 2007 Land Use Map that matches the field diagnostic observations. The observed land use from the field diagnostics are shown below:

Crossing	*2007 Observed Land Use*	*2007 Existing Pima County Land Use*
Tangerine Road	*Agricultural/Residential*	*Agricultural/Ranching Low Residential*

The Pima Association of Governments Planning Department can better answer the question of future developments. They review development impact studies and regulate zoning.

Source: ***PAG Land Use Modeling 2007 Land Use Map on http://www.pagnet.org/Documents/LandUse/LandUse2007.pdf***

CW 1.10 Please supply the following: number of daily train movements through the crossing, speed of the trains, and the type of movements being made (i.e. thru freight or switching). Is this a passenger train route?

Response: The movements are shown below for this crossing.

Train Count: 48 total average trains per day (46 freight, 2 passenger)
Train Speed: 79 mph passenger / 70 mph freight
Thru Freight/Switching Moves: All moves through this crossing are thru freight. No switching moves are made at this crossing.

This crossing is used by Amtrak as much as twice per day, three times per week.

Source: ***Union Pacific's Director of Public Affairs, Zoe Richmond***

CW 1.11 Please provide the names and locations of all schools (elementary, junior high and high school) within the area of the crossing.

Response: ***There are several schools in Pima County, Town of Marana, and City of Tucson within the area of the crossing in this application.***

Marjorie W. Estes Elem. School @ 11279 W. Grier Rd, Marana, AZ 85653
Marana Middle School @ 11279 W. Grier Rd, Marana, AZ 85653
Marana High School @ 12000 W. Emigh Road, Tucson, AZ 85743.

Source: ***1) Jennifer Crumbliss, Senior Transportation Engineer with HDR Engineering, Inc. at 8404 Indian Hills Drive, Omaha, NE 68114, (402) 926-7049 used the internet site www.GoggleEarth.com also,***
2) Juan Cruz, Roadway Designer with HDR in Tucson, physically verified hospital and school locations on June 14, 2007.

CW 1.12 Please provide school bus route information concerning the crossing, including the number of times a day a school bus crosses this crossing.

Response: ***The buses, combined, cross Tangerine Road at least 16 times per day.***

Source: ***1) Alisha Meza, Operations Manager of Transportation for Marana Unified School District located at 11279 W. Grier Rd., Suite 103, Marana, AZ 85653 (520) 616-6350***

CW 1.13 Please provide information about any hospitals in the area and whether the crossing is used extensively by emergency service vehicles.

Response: ***The nearest hospital to these crossings is NW Medical Center in Marana (approximately 12 miles southeast of Tangerine Road). To Union Pacific's knowledge, this crossing is not used extensively by emergency service vehicles.***

Source: ***1) Jennifer Crumbliss, Senior Transportation Engineer with HDR Engineering, Inc. at 8404 Indian Hills Drive, Omaha, NE 68114, (402) 926-7049 used the internet site www.GoggleEarth.com also, 2) Juan Cruz, Roadway Designer with HDR in Tucson, physically verified hospital and school locations on June 14, 2007.***

CW 1.14 Please provide total cost of the railroad improvements to each crossing.

Response:

Crossing	*Crossing Surface*	*Signal*	*Total*
Tangerine Road	$ 74,600.00	$355,900.00	$430,500.00

Source: ***Union Pacific's Engineering***

CW 1.15 Provide any information as to whether vehicles carrying hazardous materials utilize this crossing and the number of times a day they might cross it.

Response: ***Union Pacific has been unable to obtain any information responsive to this request. It is Union Pacific's understanding that any vehicle carrying hazardous materials may utilize public crossings unless otherwise posted, but Union Pacific knows of no way it can investigate or determine whether such vehicles use this crossings or with what frequency.***

CW 1.16 Please provide the posted vehicular speed limit for the roadway.

Response:

Crossing	*Posted Vehicular Speed Limit*
Tangerine Road	**40 mph***

* ***The speed limits given are those posted for the road intersecting the track. However as a practical matter, maximum speed for vehicular traffic at the crossing itself is limited to 20-25 mph at best because of the stop condition just north of the railroad tracks at the I-10 Frontage Road.***

Source: ***Jennifer Crumbliss, Senior Transportation Engineer with HDR Engineering, Inc. at 8404 Indian Hills Drive, Omaha, NE 68114***

CW 1.17 Do any buses (other than school buses) utilize the crossing, and how many times a day do they cross the crossing?

Response: ***Union Pacific does not have access to such information, but instead must rely on information provided by others. With that caveat, Union Pacific responds that it is not aware of any public passenger buses that utilize Tangerine Road.***

Source:
1) ***Suntran website http://www.suntran.com/routes.php***
2) ***Pima County Department of Transportation's Rural Bus Route website http://www.dot.co.pima.az.us/transsys/bus Contact 520-740-6403 - Patrick McGowan, Public Transportation Program Manager***

CW 1.18 Please indicate whether any spur lines have been removed within the last three years inside a 10 mile radius of [the] crossing[] covered in this application. Please include the reason for the removal, date of the removal and whether an at-grade crossing or crossings were removed in order to remove the spur line.

Response: ***Using the definition of a "spur line" or "spur track" as "a stub track of indefinite length diverging from a main track or other track," ACC Regulation R14-5-101(20), Union Pacific is not aware that any spur lines have been removed within the last three years inside a 10-mile radius of the crossing covered in this application.***

Source: ***Union Pacific's Engineering***

CW 1.19 Please fill in the attached FHWA Grade Separation Guidelines Table, (from FHWA's 2007 revised second edition Railroad Highway Grade-Crossing Handbook, page 151) with a yes or no answer as to [whether] each item applies. Also, please provide all information to support your answers of yes or no (i.e. vehicle delay numbers, any calculations that were performed to get the answers).

Response: ***Union Pacific was not involved in the preliminary design, environmental assessment, or project planning of the possible future grade separation project for a shifted Tangerine Road location that was designed and then shelved by the Town of Marana and must rely on information provided by others to provide this Grade Separation Data. With that caveat, Union Pacific responds as follows:***

The Federal Highway Administration (FHWA) Grade Separation Guidelines Table provides nine criteria for determining whether highway-rail crossings should be considered for grade separation or otherwise eliminated across the railroad right of way. Results for the

nine criteria as applied to the crossing in this application are shown in the following table:

FHWA - GRADE SEPARATION GUIDELINES

Highway-rail grade crossings should be considered for grade separation or otherwise eliminated across the railroad right of way whenever one or more of the following conditions exist:

		Tangerine Road
The highway is a part of the designated Interstate Highway System	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
The highway is otherwise designed to have full controlled access	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
The posted highway speed equals or exceeds 70 mph	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO[1]
Maximum authorized train speed exceeds 110 mph	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
An average of 150 or more trains per day or 300 million gross tons/year	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	YES[2]
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural; or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing Currently meets the criteria	URBAN - NO RURAL – YES[3]
	Crossing meets the criteria by 2030	YES[4]
Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	N/A[5]
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO[6]

1 This table utilizes the recent projected ADT data for the year 2030 as follows: Tangerine =28,500.
2 The Railraod is projected to exceed 300 million gross tons as of 2016. This projection is based on the fact that the Railroad was exceeding 217 million gross tons with 46 trains per day in 2007 and is projected to run 84 trains per day by 2016. (train lengths will increase from 6,000 feet to 8,000 feet).
3 The 2010 crossing exposure was approximately: Tangerine = 350,000.
4 The projected crossing exposure utilizing the most recent projected VPD data for 2030 is Tangerine = 1,368,000
5 N/A = Information was not available.
6 The projected vehicle delay per day utilizing the most recent projected VPD data for 2030 is Tangerine = 7.14 hours

CW 1.20 Based on the current single track configuration at the crossing[] specified by this application, please provide the current traffic blocking delay per train. Please indicate the time in which vehicular traffic is delayed (1) to allow the train to pass at a crossing and (2) due to trains stopped on the track for any purpose. The delay is measured from the point that the warning devices are activated at the crossing to the time after the train has cleared the crossing and the warning devices are reset.

Response: Delays for vehicular (roadway) traffic caused by trains occupying a crossing depend on the length and speed of each train traversing the crossing. Because each train can be unique for these values it would be impossible for Union Pacific accurately to provide the time of delay for vehicular traffic either while allowing trains to pass the crossing or because trains are stopped in the crossing. With that caveat, Union Pacific responds as follows:

Union Pacific operations are governed by maximum allowable speeds as identified by timetable. Trains at the crossings involved in this application operate at timetable speeds of 65 mph and the average length of trains is currently approximately 6,000 feet. At that train length and speed, the average delay for vehicular traffic (1) to allow the train to pass at this crossing, measured from the point that the warning devices are activated at the crossing to the time after the train has cleared the crossing and the warning devices are reset, is approximately 1.549 minutes.

The average time vehicular traffic is delayed (2) due to trains stopped on the track for any purpose, measured from the point that the warning devices are activated at the crossing to the time after the train has cleared the crossing and the warning devices are reset, varies according to the condition creating the blockage. These varied conditions include mechanical failure such as a broken air hose, a grade crossing accident, or operations such as trains meeting or passing. Given the variety of possible conditions causing trains to be stopped on a crossing, Union Pacific does not catalog the average time vehicular traffic is delayed by stopped trains. With that caveat, Union Pacific responds as follows:

A.R.S. § 40-852 requires that, except in cases of unavoidable accident, a train blocking a crossing for more than 15 minutes must be cut to facilitate traffic flow. ACC Regulation R14-5-104(C)(7) and Union Pacific's operating practices allow a train to block a public grade crossing for no more than 10 continuous minutes, unless the train is continuously moving in the same direction during the entire time it occupies the crossing, or the blockage is caused by wrecks, derailments, acts of nature, mechanical failure, or other emergency conditions.

Source: ***Union Pacific's Engineering, in consultation with TKDA at 750 Shoreline Drive, Suite 100, Aurora, IL 60504, (630) 499-4110***

ORIGINAL AND THIRTEEN COPIES
of the foregoing filed this 5th day of
August, 2011, with:

Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

COPY of the foregoing hand-delivered and e-mailed
this 5th day of August, 2011, to:

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